

A NOTE ON *HEMIOSUS EXILIS* LECONTE (COLEOPTERA: HYDROPHILIDAE)

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During a preliminary study of the genus *Berosus*, an interesting generic re-assignment was re-discovered.³ Members of this genus show sexual dimorphism in the tarsal formula, the males having 4-5-5, the females, 5-5-5.

In 1851, LeConte described *Berosus exilis* from the Gila River in Arizona. His description made no reference to the dual punctation of the pronotum or to the 5-segmented tarsi of the male. In his 1855 revision of the family Hydrophilidae, he added to his original diagnosis only the observation that *B. exilis* was, "broader than the next species and by its small size very distinct from all the preceding."

In 1873, Horn revised the tribe Hydrobiini and noted the rather unique form of the mesosternal protuberance in the species: "the mesosternal mucro when seen on its tip apparently splits into two parts in the form of a V, the open portion being posteriorly." The difference in the tarsal formula of the males remained unknown.

A new genus, *Hemiosus*, was described by Sharp (1882) in the *Biologia Centrali-Americana*, based on 14 individuals of a single species, *Hemiosus maculatus*, from Guatemala. The characters he used for generic separation from *Berosus* were: short maxillary palpi, dense, silky ventral pubescence and the large mesosternal lamina, with "its lower face forming a narrow, rhomboidal process, which is dull and pubescent, like the rest of the under surface." His final comment was, "all the tarsi 5-jointed, but the basal joint excessively short."

Leech (1943) was the first to notice the similarity between *Berosus exilis* LeConte and *Hemiosus maculatus* Sharp, in the form of the mesosternal protuberance and male genitalia, and he logically placed *B. exilis* in *Hemiosus*. However, three years earlier, in 1940, A. d'Orchymont had pointed out the difference of sexual dimorphism in tarsal formulae between the two genera, as well as the differences listed by previous authors. With this information, Leech apparently assumed that his reference of *B. exilis* to *Hemiosus* was incorrect, since he did not notice the tarsi, and published a retraction in 1948. The same year, he recorded in a separate paper (1948b) the presence of a species very close to or the same as *H. maculatus* Sharp from Baja California, accompanied by an excellent description.

To add to the confusion, a recent examination of a series of small specimens sent by Mr. Leech showed that both sexes have a minute first tarsal

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segment and four other segments of normal size (figs. 1, 2). This species was labeled "*exilis*" and bore the same locality data as that given by Leech in his (1943) paper. It now appears clear that Leech's original diagnosis was correct and that *Berosus exilis* LeConte is a member of the genus *Hemiosus*.

Examination of a single male paratype of *H. toxillus* d'Orchymont in the U. S. National Museum collection revealed a very close similarity with *H. exilis*. The paratype is smaller (2.5 mm.) in length, with the parameres more swollen basally in lateral view and with the projection of the basal piece more narrow and constricted. It seems reasonable that these differences could be part of the normal range of variation for a single species. This interpretation is supported by the fact that d'Orchymont did not know of *H. exilis*, or at least, did not refer to it in his paper (1940). However, having seen only a single specimen of *H. toxillus* from Sinaloa, Mexico, and only small series of *H. exilis* from Arizona (Phoenix and Gila Bend), it seems best to retain both names although separation may prove difficult.

The three North American species of *Hemiosus* may be separated by the following characteristics:

1. Pro-tarsus with second segment more thickened in male (fig. 1) than in female (fig. 2) and with a ventral pad of hairs longer than in the other segments; male genitalia with median lobe slender in lateral view (fig. 5); pronotum metallic black, with broad anterior and posterior yellow margins----- 2
- Pro-tarsus with second segment not appreciably different in male than in female; male genitalia with median lobe broad in lateral view (fig. 4); pronotum entirely metallic black, without yellow borders; Peru; Guatemala; Panama; Mexico: Sinaloa, Colima, Baja California-----MACULATUS Sharp
2. Male genitalia with parameres more swollen basally, in lateral view, basal piece with projection more constricted (fig. 5); size smaller, 2.5 mm.; Mexico: Mazatlan, Sinaloa -----TOXILLUS d'Orchymont
- Male genitalia with parameres narrower basally, in lateral view, basal piece barely constricted, especially in lateral view (fig. 7); size larger, 3.0-3.2 mm.; U.S.A.: Arizona: Gila Bend, and Phoenix-----EXILIS LeConte



FIGURES 1-2, *Hemiosus exilis* LeConte. 1—Protarsus of male. 2—Protarsus of female.

The male genitalia of *Hemiosus* species show some interesting complexities not found in any species of Nearctic *Berosus*. The most obvious of these is the presence of a pair of membranous, inflated lobes, which are

situated in hollowed out cavities in the parameres in repose and unite ventrally beneath the median lobe. Another peculiarity is the structure of the median lobe. Situated along its ventral length is a spinous (*H. maculatus*, figs. 3, 4) or slender and flattened (*H. toxillus*, *H. exilis*, figs. 5-7) projection which is barely visible in repose, but which becomes displaced downward when the genitalia are inflated (fig. 4).

These structures cannot be seen unless they are inflated; this was accomplished by placing the genitalia in cold KOH for 15 minutes, then removing them to water for 15-30 minutes. Alcohol usually effected retraction of the membranous lobes, but glycerine did not. Further study is needed to reveal the exact nature and significance of these interesting features.



FIGURES 3-7, *Hemiosus* spp. 3—*H. maculatus* Sharp, male genitalia, ventral view, expanded. 4—Same, lateral view. 5—*H. toxillus* d'Orchymont, male genitalia of paratype, lateral view. 6—*H. exilis* LeConte, male genitalia, ventral view, slightly expanded. 7—Same, except basal piece only, lateral view.

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When tackling the problem offered by the geographical areas of plants, many authors have chosen to discuss peculiar or singular types having a distribution out of the common, in the hope that they will suddenly give a clue to the solution of the problem. This is merely appealing to the imagination, it is, so to speak, a romantic method of investigation. . . . It is surely more rational to start the investigation with the simplest types, those that show the least possible peculiarities. When they have been interpreted, the complicated and often strongly interrupted areas of the singular or peculiar types are likely to be better understood. This is a more prosaic, but probably also a safer method of procedure.—Eric Hultén, 1937, Outline of the History of Arctic and Boreal Biota during the Quarternary Period.